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Part 2

AIRCRAFT COLLISION AVOIDANCE ACT OF 1987

OCTOBER 6, 1987.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

Mr. ROE, from the Committee on Science, Space, and Technology, submitted the following

REPORT

together with

ADDITIONAL VIEWS

[To accompany H.R. 1517 which on March 10, 1987, was referred jointly to the Committee on Public Works and Transportation, and the Committee on Science, Space, and Technology]

[Including cost estimate of the Congressional Budget Office]

The Committee on Science, Space, and Technology, to whom was referred the bill (H.R. 1517) to amend the Federal Aviation Act of 1958 to require the installation and use of collision avoidance systems in aircraft, to require the Federal Aviation Administration to complete research on and development of the TCAS-III collision avoidance system as soon as possible, and for other purposes, having considered the same, report favorably thereon with an amendment and recommend that the bill as amended do pass.

CONTENTS

Amendment		Page
I.	Background	3
II.	The Need for Collision Avoidance Systems	4
III.	Explanation of the Bill and Committee Views	5
IV.	Section-by-Section Description of H.R. 1517	5
V.	Congressional Budget Office Cost Estimate	6
VI.	Inflationary Impact Analysis	7
VII.	Committee Oversight Findings and Recommendations	7
VIII.	Oversight Findings and Recommendations by the Committee on Government Operations	7
IX.	Budget Analysis and Projection	7
X.	Changes in Existing Law Made by the Bill, as Reported	7

77-860

H703-13

XI. Committee Recommendation 9
XII. Additional Views 10

The amendment is as follows:

Strike out all after the enacting clause and insert in lieu thereof the following:

SECTION 1. SHORT TITLE.

This Act may be cited as the "Aircraft Collision Avoidance Act of 1987".

SEC. 2. FINDINGS.

Congress finds that—

(1) the number of near midair collisions is an indication that additional measures must be taken to assure the highest level of air safety in the United States;

(2) public health and safety requirements necessitate the timely completion and installation of a collision avoidance system for use by commercial aircraft flying in the United States;

(3) the Traffic Alert and Collision Avoidance System promises to reduce the threat to life caused by midair collisions, particularly collisions between general aviation aircraft and commercial aircraft;

(4) the Traffic Alert and Collision Avoidance System will succeed only to the degree that other aircraft posing a collision threat are equipped with pressure altitude-encoding equipment; and

(5) the Federal Aviation Administration should continue at a deliberate pace the development of additional technologies, including TCAS–III, to ensure the safe separation of aircraft.

SEC. 3. COLLISION AND AVOIDANCE SYSTEMS.

(a) IN GENERAL.—Section 601 of the Federal Aviation Act of 1958 (49 U.S.C. App. 1421) is amended by adding at the end the following new subsection:

"(f) COLLISION AVOIDANCE SYSTEMS.—

"(1) DEVELOPMENT AND CERTIFICATION.—

"(A) Standards.—The Administrator shall complete development of the collision avoidance system known as TCAS–II so that such system will be operable under visual and instrument flight rules and will be upgradable to the performance standards applicable to the collision avoidance system known as TCAS–III.

"(B) SCHEDULE.—The Administrator shall develop and implement a schedule for development and certification of the collision avoidance system known as TCAS–II which will result in completion of such certification not later than 18 months after the date of the enactment of this subsection.

"(C) MONTHLY REPORTS.—The administrator shall transmit to Congress monthly reports on the progress being made in development and certification of the collision avoidance system known as TCAS–II.

"(2) INSTALLATION.—The Administrator shall require by regulation that, not later than 30 months after the date of certification of the collision avoidance system known as TCAS–II, such system be installed and operated on each civil aircraft which has a maximum passenger capacity of more than 30 seats and which is used to provide air transportation of passengers, including intrastate air transportation of passengers.

"(3) AUTOMATIC PRESSURE ALTITUDE-ENCODING EQUIPMENT.—The Administrator shall require by regulation that automatic pressure altitude-encoding equipment be installed and operated on each civil aircraft (other than an aircraft to which paragraph (2) applies) operating in a high traffic density area, as designated pursuant to rulemaking by the Administrator.".

(b) CONFORMING AMENDMENT.—That portion of the table of contents contained in the first section of the Federal Aviation Act of 1958 which appears under the side heading

"Sec. 601. General safety powers and duties.".

is amended by adding at the end the following:

"(f) Collision avoidance systems.".

SEC. 4. RESEARCH AND DEVELOPMENT.

(a) COMPLETION OF TCAS–III.—The Administrator of the Federal Aviation Administration shall complete the research and the development on, and the certification of, the collision avoidance system known as TCAS–III as soon as possible.

(b) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated such sums as may be necessary from the Airport and Airway Trust Fund to carry out this section.

I. BACKGROUND

The basic Threat Alert and Collision Avoidance System (TCAS) design is one that evolved in the mid-1970's from two decades of effort to devise an airborne collision avoidance system that was both technically and economically viable. The TCAS design concept was based on the desire that each aircraft should gain protection as soon at it was equipped with such a system, and that it was not necessary to require that every aircraft be fitted with a TCAS systems. Thus, the FAA chose the TCAS design because it would take advantage of the fact that all commercial transports and military aircraft already are required to carry radar transponders that automatically report the aircraft's altitude. Growing numbers of smaller general aviation aircraft were being equipped as well on a voluntary basis.

The TCAS system detects the presence of other aircraft by transmitting interrogations that elicit replies from transponder equipped aircraft in its vicinity. From those replies, it can sort out those that pose a collision threat. If a potential threat persists until the minimum separation time decrease to 30 seconds (for aircraft flying above 18,000 feet) the TCAS system sounds an alarm and displays a command telling the pilot what maneuver to take to avoid the collision.

The TCAS system includes three types of basic equipment: TCAS–I, TCAS–II, and TCAS–III. TCAS–I is a system designed for small carriers. It can detect the presence of potential threats and display their approximate bearing and altitude, but it cannot generate resolution maneuvers. TCAS–I has been developed and tested, but has not undergone production design by any avionics manufacturers. TCAS–II not only detects the presence of potential threats, but also provides a conflict resolution maneuver, telling the pilot to climb, descend, or halt the existing climb or descent. TCAS–III is capable of providing both vertical and horizontal conflict resolution maneuvers. Other aircraft need to be equipped with altitude encoding transponders in order for the TCAS systems to be able to detect them.

A Notice of Proposed Rulemaking, issued August 26, 1987 by the FAA, would require all commercial transports and corporate aircraft to be equipped with TCAS II by the early 1990's. The FAA's proposed timetable calls for finalizing the TCAS rule by October 1988, with the provision that all commercial transports be outfitted within 4–5 years, depending on aircraft type.

The required TCAS (TCAS–II) is similar to the one being tested on a Piedmont Airlines Boeing 727. Additional evaluations are planned by United, Northwest, and Piedmont later this year, under a FAA-sponsored effort called the LIP (Limited Installation Program). For these tests, Allied Signal/Bendix will supply two systems to United Airlines for installation on a Boeing 737 and a McDonnell Douglas DC–8. Honeywell Sperry will supply systems for installation on two Northwest McDonnell Douglas MD–8's and two Boeing 727's.

TCAS–III which provides the additional horizontal maneuvering capability, will require additional research and development on an upgraded directional antenna system, and system software. Flight tests will also be necessary to obtain certification.

II. The Need for Collision Avoidance Systems

A number of airline accidents in recent years clearly demonstrate the need for collision avoidance systems. In September 1978, a Pacific Southwest Airlines Boeing 727 collided with a general aviation aircraft over San Diego, California, killing 144 people, including 7 on the ground. In August 1984, a Wings West Airlines Beech 99 commuter aircraft crashed colliding with a general aviation aircraft over San Luis Obispo, California, resulting in 17 deaths. In August, 1986 an Aero Mexico Beoing 727 on approach to Los Angeles International Airport was struck by a general aviation aircraft within the Terminal Control Area over Cerritos, California killing 82 people, including 15 on the ground. And in January of this year, a Sky West Airlines Metroliner on approach to Salt Lake City collided with a general aviation aircraft killing 10 people. The FAA has analyzed these accidents and has concluded that if these airline aircraft had been equipped with TCAS–II, the accidents could have been prevented.

The dramatic increase in near-misses, as reported by the National Transportation Safety Board, also indicate the need for collision avoidance systems. Near mid-air collisions have increased from 589 in 1984, to 758 in 1985, and to 839 in 1986. In the first eight months of 1987 there were 336 near mid-air collision reports, compared to 230 in the first eight months of 1986.

III. Explanation of the Bill and Committee Views

The bill directs the Federal Aviation Administration to develop and implement an 18 month schedule to complete certification and operational approval of TCAS–II. During the 18 months, the FAA is to report to Congress monthly on its progress toward certification.

Also during the 18 months the FAA is directed to develop regulations to require the installation of TCAS–II within 30 months from certification, on all aircraft with more than 30 seats. These two requirements should mean that the entire airline fleet operating within the United States airspace should have TCAS–II on board within four years, or by late 1991.

The bill requires the Federal Aviation Administration to complete certification of TCAS–III as soon as possible, and authories appropriations from the Airport and Airway Trust Fund to carry out this effort. The Federal Aviation Administration is directed to ensure that TCAS–II is designed to be readily modified to incorporate subsequent TCAS–III technology.

The bill directs the FAA to issue regulations to require that all aircraft operating in high density traffic areas be equipped with Mode-C transponders. Widespread use of Mode-C altitude reporting transponders by aircraft operating in areas of high air traffic density is key to TCAS's effectiveness.

The expanded use of Mode-C will enhance the effectiveness of the TCAS approach to collision avoidance. The Committee believes that increasing the number of aircraft with Mode-C has safety benefits aside from TCAS. Mode-C enables air traffic controllers to do their jobs more effectively because of the enhanced radar image as well as the identification and altitude information provided.

The Committee also recognizes that the FAA, from time to time, has allowed for certain glider, helicopter, balloon, agricultural, or other specialized aircraft operations to be exempt from the altitude encoding requirements of terminal control areas, provided such operations do not adversely impact on aviation safety. The Committee believes the FAA should continue to exercise the flexibility under the bill.

IV. Section-by-Section Description of H.R. 1517

Section 1.—Establishes a short title "Aircraft Collision Avoidance Act of 1987."

Section 2.—Sets forth the following Congressional findings:

(1) the number of near midair collisions is an indication that additional measures must be taken to assure the highest level of air safety in the United States;

(2) public health and safety requirements necessitate the timely completion and installation of a collision avoidance system for use by commercial aircraft flying in the United States;

(3) the Traffic Alert and Collision Avoidance System promises to reduce the threat to life caused by midair collision, particularly collisions between general aviation aircraft and commercial aircraft;

(4) the Traffic Alert and Collision Avoidance System will succeed only to the degree that other aircraft posing a collision threat are equipped with pressure altitude-encoding equipment; and

(5) the Federal Aviation Administration should continue at a deliberate pace the development of additional technologies, including TCAS–III, to ensure the safe separation of aircraft.

Section 3.—Amends Section 601 of the Federal Aviation Act to direct the FAA Administrator to complete development on the TCAS–II collision avoidance system so that it will be operable under visual and instrument flight rules and will be designed to be readily modified to TCAS–III.

The Administrator is further directed to develop and implement an 18 month schedule from date of enactment for completing development and certification of TCAS–II and to make monthly reports of progress to the Congress.

The Administrator is also directed to require by regulation that airlines install the TCAS–II system within 30 months of certification, on each aircraft with more than 30 seats.

The Administrator is also directed to require by regulation that aircraft operating in high traffic density areas be equipped with Mode-C altitude encoding transponders.

Section 4.—Directs the FAA Administrator to complete the research, development, and certification of TCAS–III as soon as possible.

Authorizes appropriations from the Airport and Airway Trust Fund to carry out the research, development, and certification of TCAS–III.

V. Congressional Budget Office Cost Estimate

Pursuant to Section 403 of the Congressional Budget Act of 1974 and rule XI, clause 2(1)(3) of the Rules of the House of Representatives, the report of the Congressional Budget Office follows:

U.S. Congress,
Congressional Budget Office,
Washington, DC, September 30, 1987.

Hon. Robert A. Roe,
Chairman, Committee on Science, Space, and Technology, House of Representatives, Rayburn House Office Building, Washington, DC.

Dear Mr. Chairman: The Congressional Budget Office has reviewed H.R. 1517, the Aircraft Collision Avoidance Act of 1987, as ordered reported by the House Committee on Science, Space, and Technology, September 29, 1987. We estimate that enactment of the bill would result in no significant cost to the federal government and in no cost to state or local governments.

H.R. 1517 would require that the Administrator of the Federal Aviation Administration (FAA) complete development of the Traffic Alert and Collision Avoidance System (TCAS–II), develop and implement a schedule for its development that will result in its certification within 18 months after the date of enactment of this bill, and transmit monthly reports to the Congress on the progress made to develop and certify the collision avoidance system. This bill would also require that the collision avoidance system be installed within 30 months of certification on all civil aircraft with a maximum seating capacity of more than 30 seats. In addition, H.R. 1517 would require that automatic pressure altitude encoding equipment be installed on all other aircraft operating in high traffic areas, and that the Administrator complete the development and certification of the TCAS–III system as soon as possible.

Based on information form the FAA, CBO estimates that enactment of this bill would result in no significant additional cost to the federal government. The FAA is already working to develop and certify TCAS–II and TCAS–III as quickly as possible. There would be some minor costs to prepare the monthly reports.

If you wish further details on this matter, we will be pleased to provide them.

With best wishes,
Sincerely,

Edward M. Gramlich,
Acting Director.

VI. Inflationary Impact Analysis

In accordance with Rule XI, Clause 2(l)(4), of the Rules of the House of Representatives, this legislation is assessed to have no adverse inflationary effect on prices and costs in the operation of the national economy.

VII. Committee Oversight Findings and Recommendations

Pursuant to Rule XI, Clause 2(l)(3)A, and under the authority of Rule X, Clause 2(b)(1) and Clause 3(f), of the Rules of the House of Representatives, the following statement on oversight activities is made: The Committee's oversight findings are incorporated in the recommendations contained in the present bill and report.

VIII. Oversight Findings and Recommendations by the Committee on Government Operations

Pursuant to Rule XI, Clause 2(l)(3)(D), and under the authority of Rule X, Clause 2(c)(2), of the Rules of the House of Representatives, no findings or recommendations on oversight activity have been received from the Committee on Government Operations for inclusion in this report.

IX. Budget Analysis and Projection

The bill provides no new budget authority and consequently the provisions of Section 308(a) of the Congressional Budget Act are not applicable.

X. Changes in Existing Law Made by the Bill, as Reported

In compliance with clause 3 of rule XIII of the Rules of the House of Representatives, changes in existing law made by the bill, as reported, are shown as follows (existing law proposed to be omitted is enclosed in black brackets, new matter is printed in italic, existing law in which no change is proposed is shown in roman):

Federal Aviation Act of 1958

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TABLE OF CONTENTS

Title I—General Provisions

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Title VI—Safety Regulation of Civil Aeronautics

Sec. 601. General safety powers and duties.
(a) Minimum standards: rules and regulations.
(b) Needs of service to be considered; classification of standards, etc.
(c) Exemptions.
(d) Emergency locator transmitters.
(e) Aviation fuel standards.
(f) Collision avoidance systems.

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TITLE VI—SAFETY REGULATION OF CIVIL AERONAUTICS

General Safety Powers and Duties

minimum standards; rules and regulations

Sec. 601. (a) * * *

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(f) Collision Avoidance Systems.—

(1) Development and certification.—

(A) Standards.—The Administrator shall complete development of the collision avoidance system known as TCAS-II so that such system will be operable under visual and instrument flight rules and will be designed to be readily modified to the performance standards applicable to the collision avoidance system known as TCAS-III.

(B) Schedule.—The Administrator shall develop and implement a schedule for development, certification, and operational approval of the collision avoidance system known as TCAS-II which will result in completion of such certification and approval not later than 18 months after the date of the enactment of this subsection.

(C) Monthly reports.—The Administrator shall transmit to Congress monthly reports on the progress being made in development, certification, and operational approval of the collision avoidance system known as TCAS-II.

(2) Installation.—The Administrator shall require by regulation that, not later than 30 months after the date of certification and operational approval of the collision avoidance system known as TCAS-II, such system be installed and operated on each civil aircraft which has a maximum passenger capacity of more than 30 seats and which is used to provide air transportation of passengers, including intrastate air transportation of passengers.

(3) Automatic pressure altitude-encoding equipment.—The Administrator shall require by regulation that automatic pressure altitude-encoding equipment be installed and operated on each civil aircraft (other than an aircraft to which paragraph (2) applies) operating in a high traffic density area, as designated pursuant to rulemaking by the Administrator.

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XI. Committee Recommendation

A quorum being present, the bill was ordered favorably reported on September 29, 1987, by unanimous voice vote.

XII. Additional Views of Representative Dan Glickman

While I am very supportive of this legislation and the concept behind it, I have some concerns about its implementation. When the full Science, Space, and Technology Committee marked up this bill, I offered an amendment, which was subsequently withdrawn, that would have allowed the Secretary of Transportation to establish a loan program whereby the government could loan up to 50 percent of the money necessary to install collision avoidance equipment on aircraft. The moneys would have come from the aviation trust fund and loan payments returned to the fund.

My concerns arise for a number of reasons. First, I have long been concerned about the huge surplus resting in the aviation trust fund. Through various attempts, I have been supportive of efforts to see that the moneys are used for their intended purpose: to make needed improvements in the aviation infrastructure. Therefore, I feel that if the money is there, it should be available for such things as speeding up the installation of collision avoidance equipment.

Second, for far too long, we have heard promises that new technologies for making the system safer are just "around the corner." Frankly, I am concerned that this same thing could happen when moving ahead on the installation of TCAS and other collision avoidance equipment. I think it would be a tragedy to have aircraft owners use cost as a reason not to move ahead with the installation of equipment as mandated by this bill. Too many excuses have been used in the past but while there is over $5 billion in the aviation trust fund, cost should not be one of them.

I do think this bill goes a long way toward ensuring a safer air system and perhaps my idea of loaning moneys from the trust fund to expedite the installation of collision avoidance equipment is a bit before its time. However, I do feel that there will be a need to take steps such as this in the future to insure that the safety goals of this Committee are met.

Dan Glickman.

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